US ERA ARCHIVE DOCUMENT



Sixth Biennial Freshwater Spills Symposium, May 2006

Water Quality Assessment and Monitoring in New Orleans Following Hurricane Katrina

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 Federal Agency Joint Task Force and affiliated support organizations Satellite
Image of
Hurricane
Katrina















Debris Issues (and Damaged Buildings)

Emergency Hurricane Debris Burning Guidance
EPA resources on debris
Other federal resources on debris

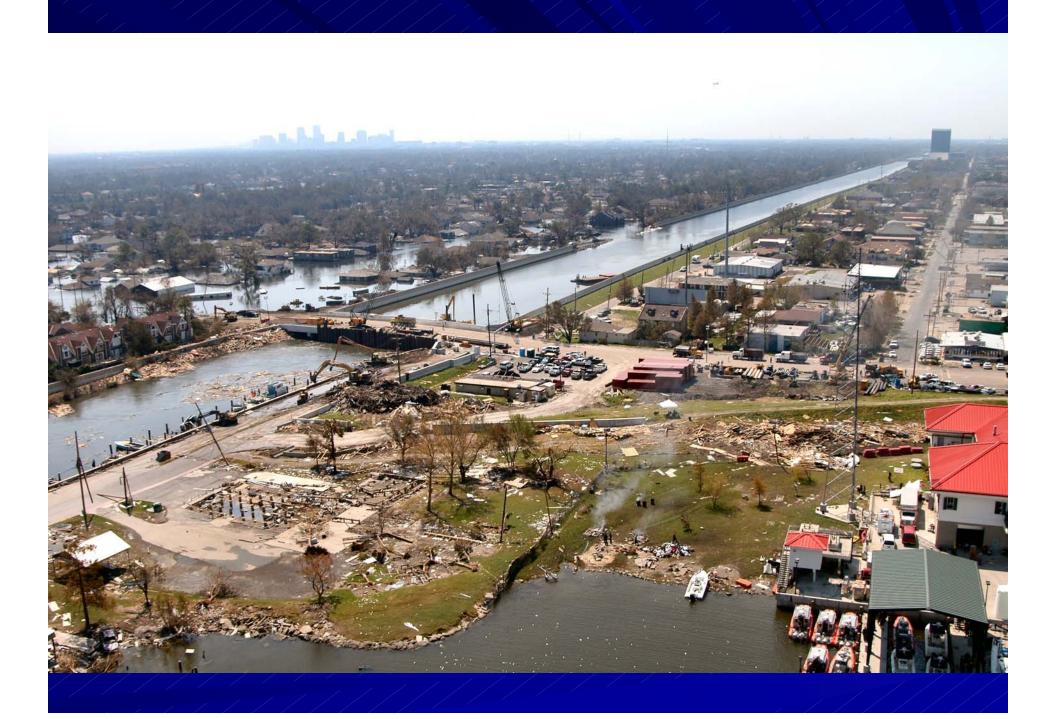
The U.S. Environmental Protection Agency and other federal, state and local officials are urging individuals to use caution when returning to hurricane-damaged homes and buildings. EPA today issued an advisory to the public that provides general guidance to help address potential hazards in structures damaged by hurricane Katrina.

EPA urges the public to be on the alert for leaking containers and reactive household chemicals, like caustic drain cleaners and chlorine bleach, and take the following necessary precautions to prevent injury or further damage:

- Keep children and pets away from leaking or spilled chemicals.
- Do not combine chemicals from leaking or damaged containers as this may produce dangerous or violent reactions.
- •Do not dump chemicals down drains, storm sewers or toilets.
- Do not attempt to burn household chemicals.
- Clearly mark and set aside unbroken containers until they can be properly disposed of
- •Leave damaged or unlabeled chemical containers undisturbed whenever possible.

Second Failure of 9th Street Levee

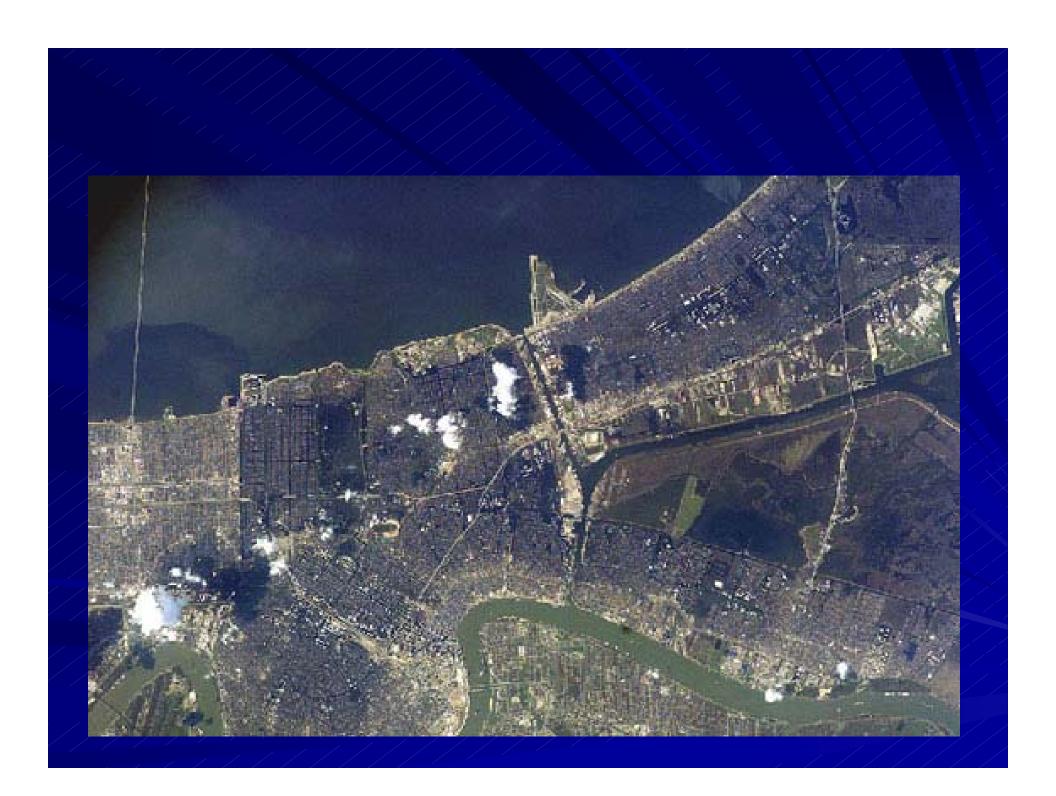






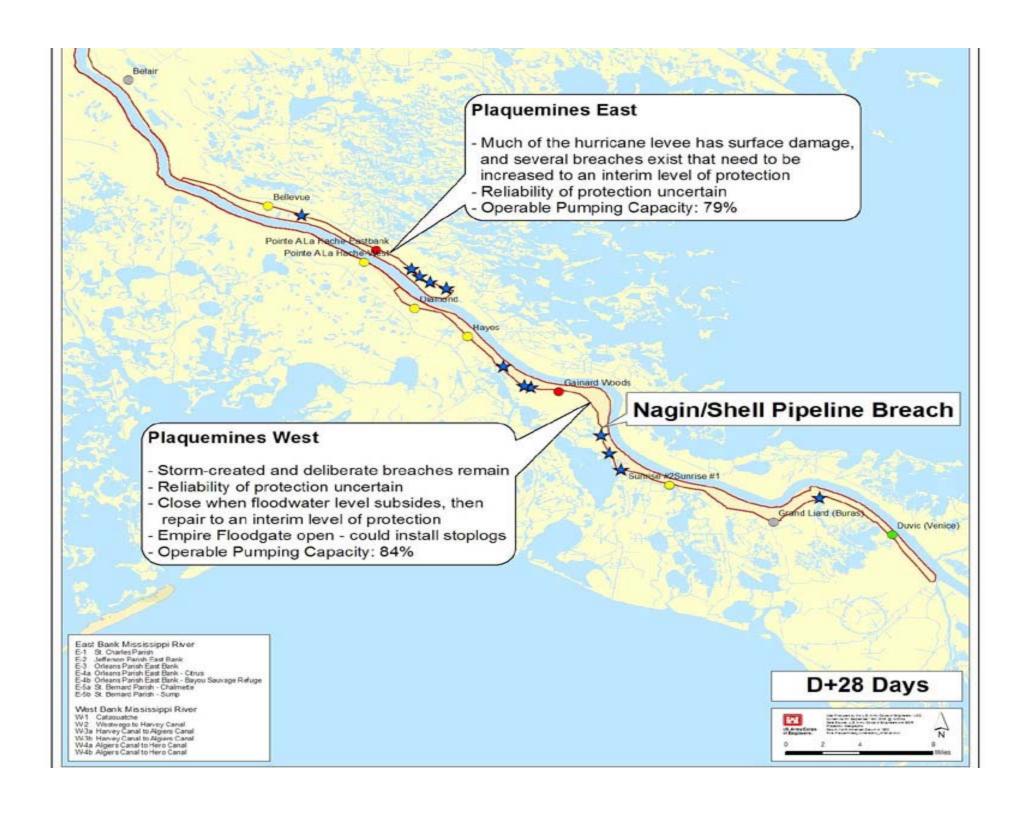
Katrina and Rita Affected area Roughly the size of the United Kingdom

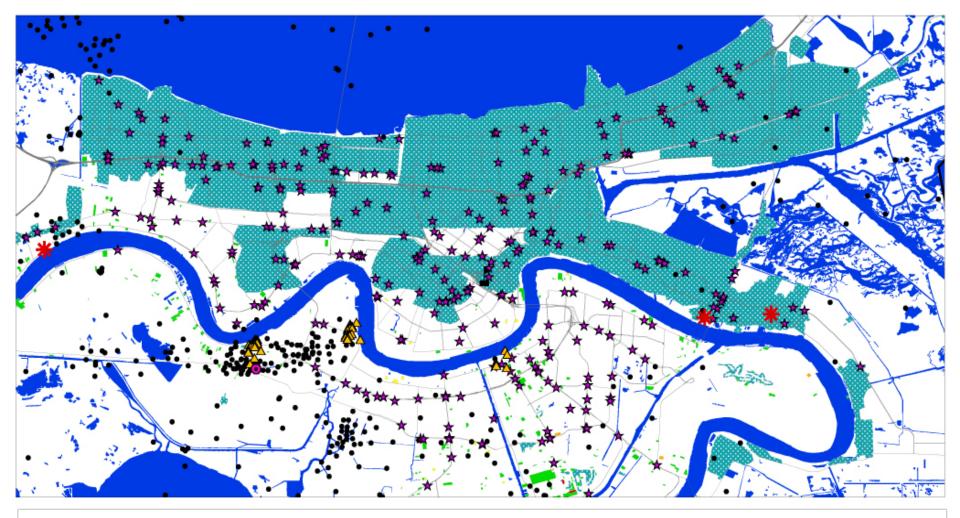
- 1.2 million households received \$3.5 billion in federal disaster assistance
- 43 million meals served by the American Red Cross and Salvation Army
- 285,000 cars damaged by floods
- Over 1,000 deaths in Louisiana
- Over \$200 billion in damages

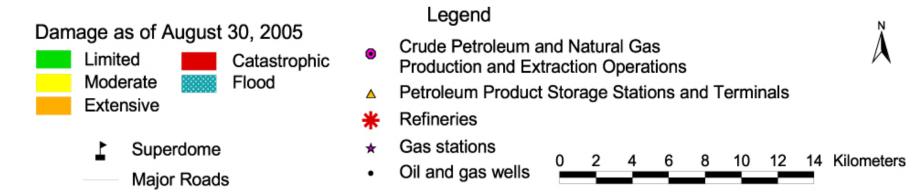


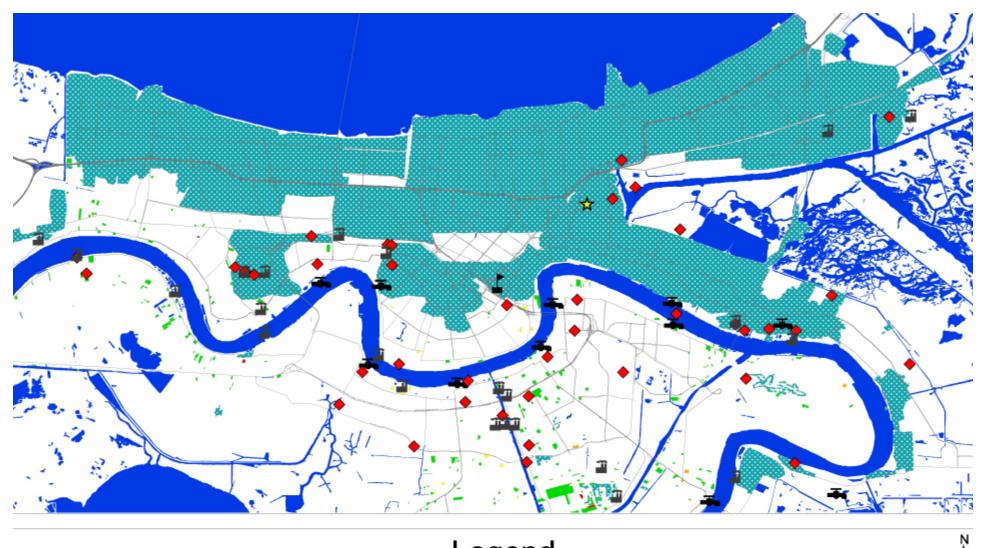


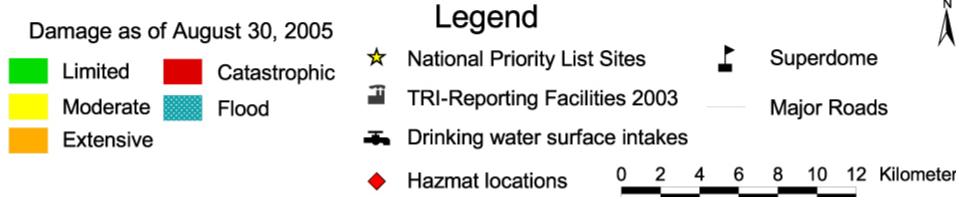
New Orleans Vulnerabilities Current as of 25 Sep 05 - 1430hrs Levee Breaches ★ Storm Induced Lake Pontchartrain A Deliberate Orleans East (Citrus) Closed - Current protection from Lake Pontchartrain 10' - 12' Orleans East Bank (Metro) **Pumping Stations** One deliberate unwatering notch exists - South levee weakened; Approx. 5 to 6 foot protection Greater Than 90% Capacity - Protected against tidal flux - Operable Pumping Capacity: 82% - Breach repairs at 17th Street and London Avenue O 40% to 90% Capacity canals vulnerable to storm surge Less Than 40% Capacity - Current protection to about 8' NGVD Under Assessment - Have temporarily raised to 10' - 12' with sheetpile at canal - Operable Pumping Capacity: 39% **Estimated Flood Extents** /// Pre-Katrina Wetlands 25 September 2005 Jahncke P/S (#14) Storm Breach Maximum Storm Breach (London Avenue) Citrus P/S (#10) Levee Districts (17th Street) Maxent P/S (#18) Dry New Orleans East Not Dry St. Charles P/S (#16) Dwyer P/S (DR) Grant P/S (GS) Canal St. P/S Lake Borgne P/S #6 E-2 Monticello P/S (MONT) P/S #17 P/S#2 Orleans East Bank ■ P/S #1 Chalmette - Federal levee along MRGO severely damaged offers little to no protection Back levee with approximately 5 - 6 foot protection Operable Pumping Capacity: 81% W-4b East Bank Mississippi River Edit Delink MISSSopph NAPE Ed. 3. Charles Panish Ed. Jefferson Parish East Bank Ed. Orleans Panish East Bank Ed. Orleans Panish East Bank - Chus Ed. Orleans Panish East Bank Ed. Orleans Panish East Bank Ed. Orleans Panish - Chus Ed. Orleans - Chus Ed. O W-3a D+28 Days **Chalmette Extension** W-2 - Federal levee along MRGO severely damaged -West Bank Mississippi River St. Bernard Parish offers little to no protection W-1 Catacustine W-2 Westweps to Harvey Canal W-3a Harvey Canal to Algiers Canal W-3b Harvey Canal to Algiers Canal W-4b Algers Canal to Hero Canal W-4b Algers Canal to Hero Canal - Back levee with approximately 5 - 6 foot protection P/S #8 - Operable Pumping Capacity: 93%





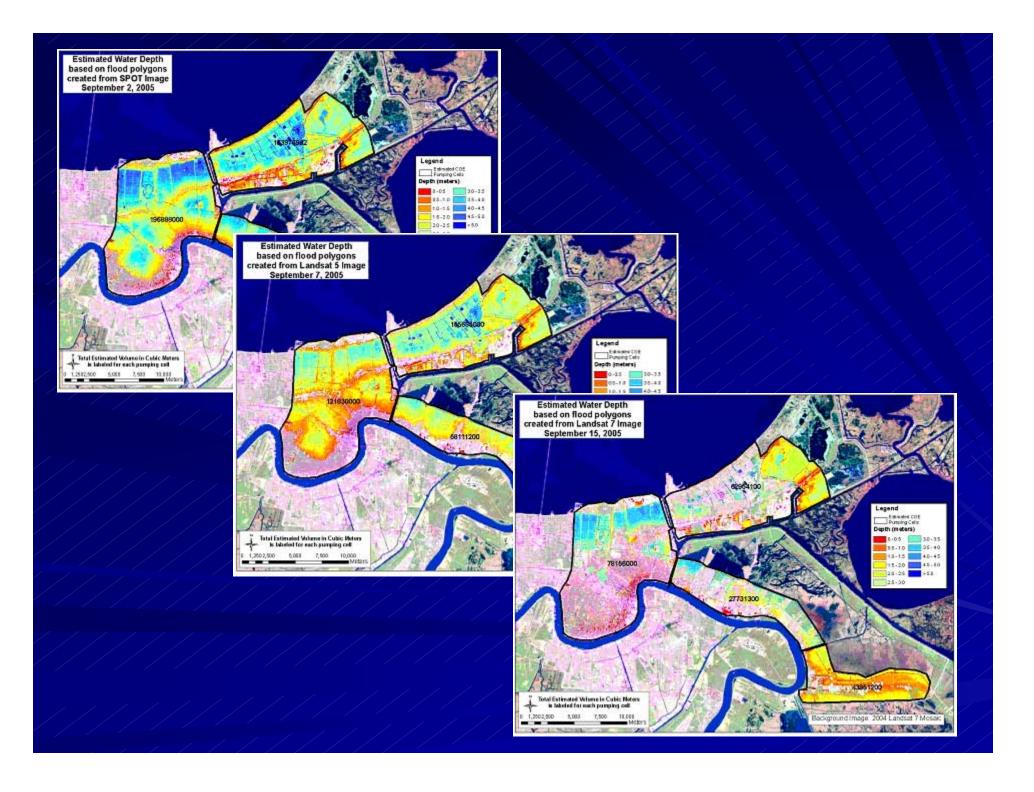






New Orleans Dewatering Operation

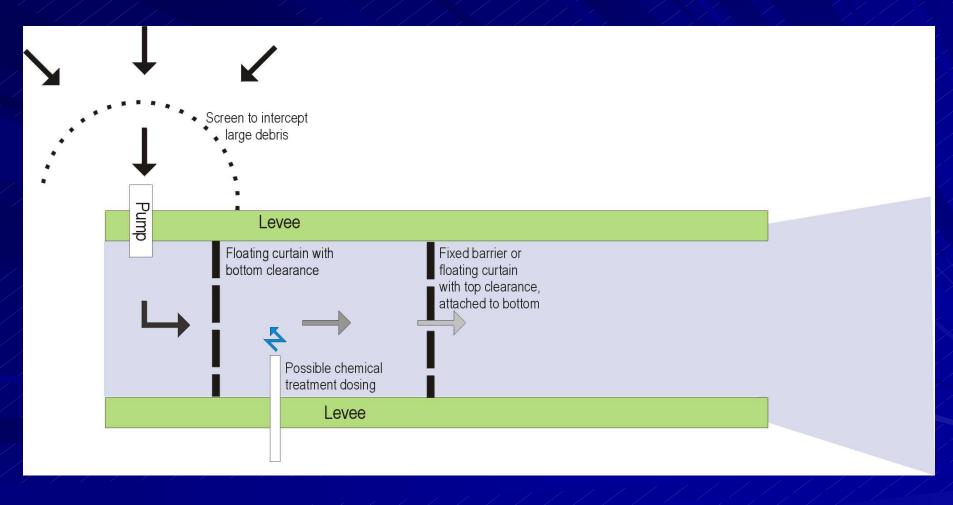
- Restoration of existing pump stations
- Establish and operate 34 temporary pump stations
- 24/7 operation to maximize dewatering
- Averaged 5 billion gals per day over 43 day dewatering operation
- Address water quality issues without slowing pumping operation
- Collect water borne deceased with dignity



Water Quality

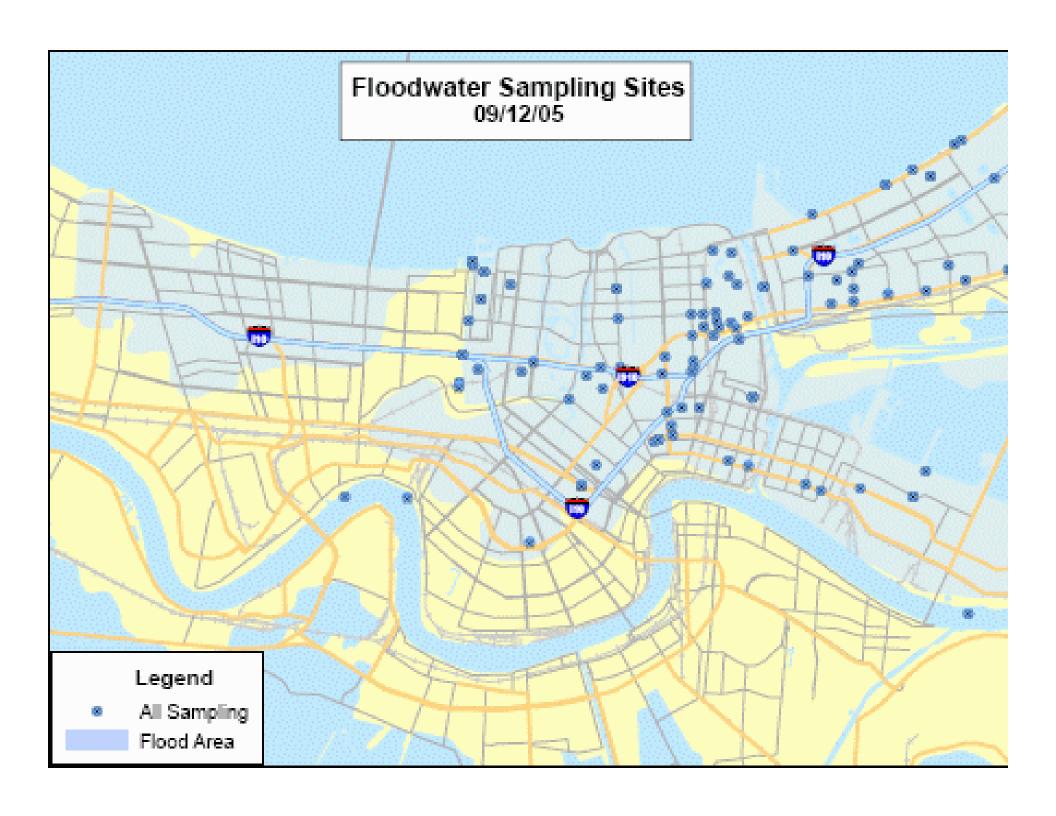
- Establish floating debris diversion and collection systems
- Install absorbent booms before and after pump locations
- Operate floating aerators before and after pump locations
- Monitor water quality and sediments throughout the system

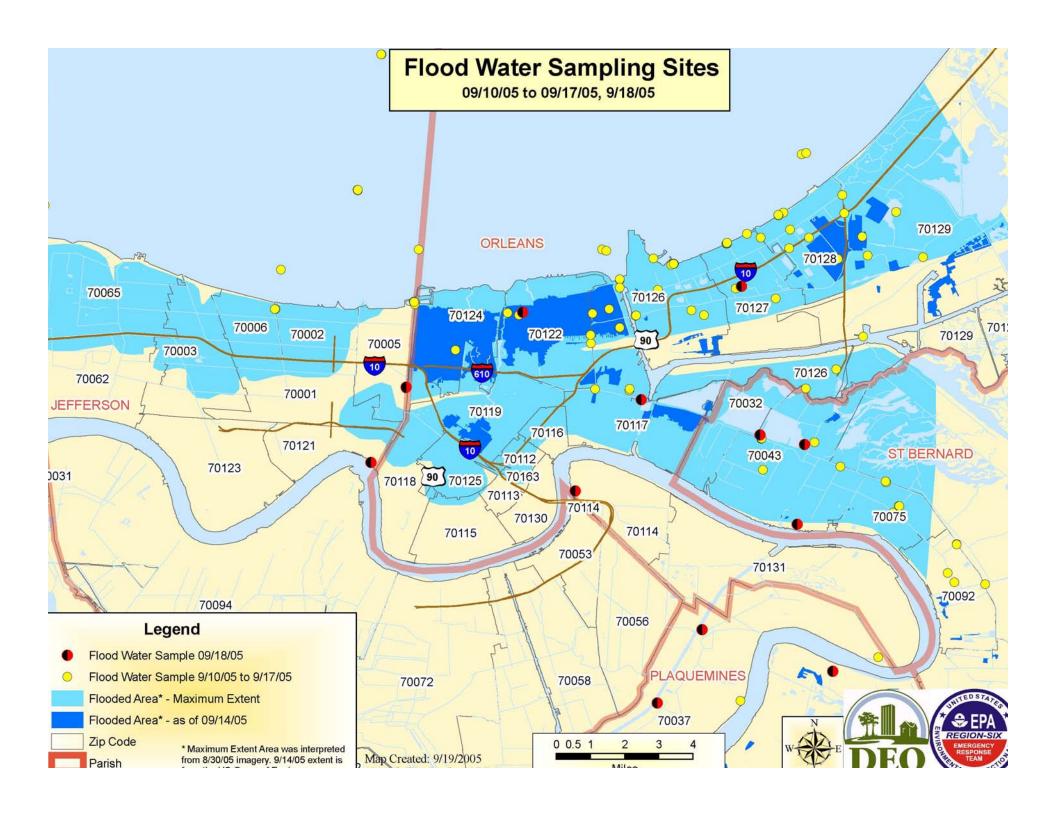
Illustration of in-canal expedient water treatment system











Sampled and Found Exceeds EPA Limits

CASNumber	Name	Measured Level (µg/L)	EPA Limit (μg/L)
7439-92-1	Lead	20	15

Sampled and Found meets EPA Limits

CASNumber	Name	Measured Level (μg/L)	EPA Limit (μg/L)
7440-39-3	Barium	210	2000
7440-50-8	Copper	62	1300
57-12-5	Cyanide	29.7	200

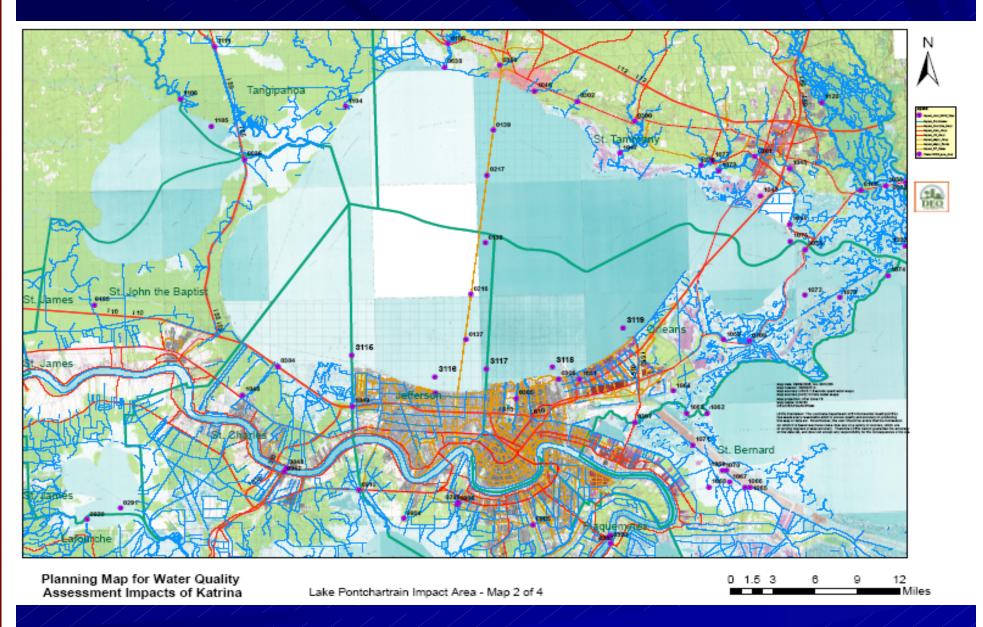
Sampled & Found but No EPA Limits Currently

CASNumber	Name	Measured Level (μg/L)
7429-90-5	<u>Aluminum</u>	1290
7440-70-2	<u>Calcium</u>	111000
7439-89-6	<u>Iron</u>	1930
7439-95-4	Magnesium	99200
7439-96-5	<u>Manganese</u>	669
7440-02-0	<u>Nickel</u>	22
7440-09-7	<u>Potassium</u>	52700
7440-22-4	<u>Silver</u>	12
7440-23-5	<u>Sodium</u>	724000
7440-66-6	Zinc	292

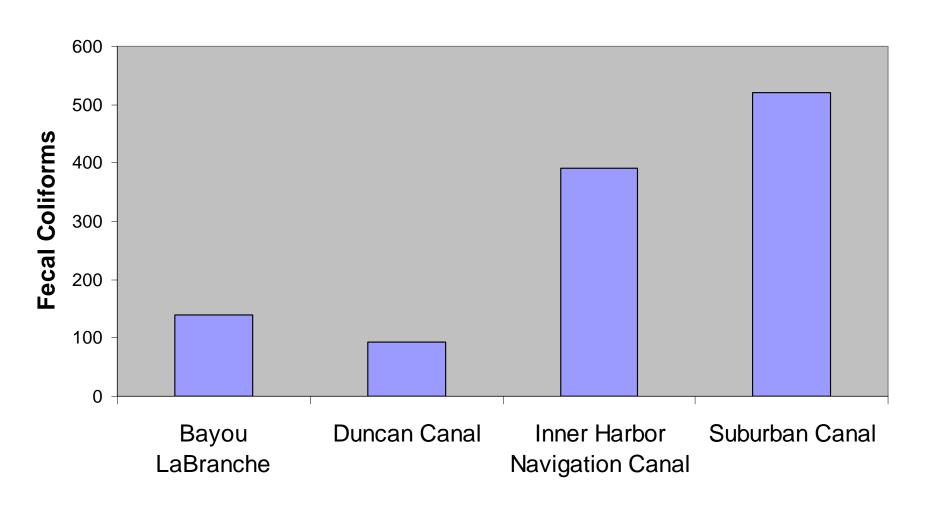
Example EPA Biological Water sample data

Sample Date	County	Location Description	Sample Number	Bacteria	Colonies/100 mL
9/8/2005	JEFFERSON	Bonneville Canal	15178	E. coli	5818
9/8/2005	JEFFERSON	Outfall	15561	E. coli	6260
9/8/2005	JEFFERSON	Outfall	15562	E. coli	7568
9/8/2005	ORLEANS	Louisa & Almonaster	15172	E. coli	462
9/8/2005	ORLEANS	Independence & Marais	15175	E. coli	7308
9/8/2005	ORLEANS	Independence & Marais	15176	E. coli	8212
9/8/2005	ORLEANS	Kenilworth Canal	15177	E. coli	5702

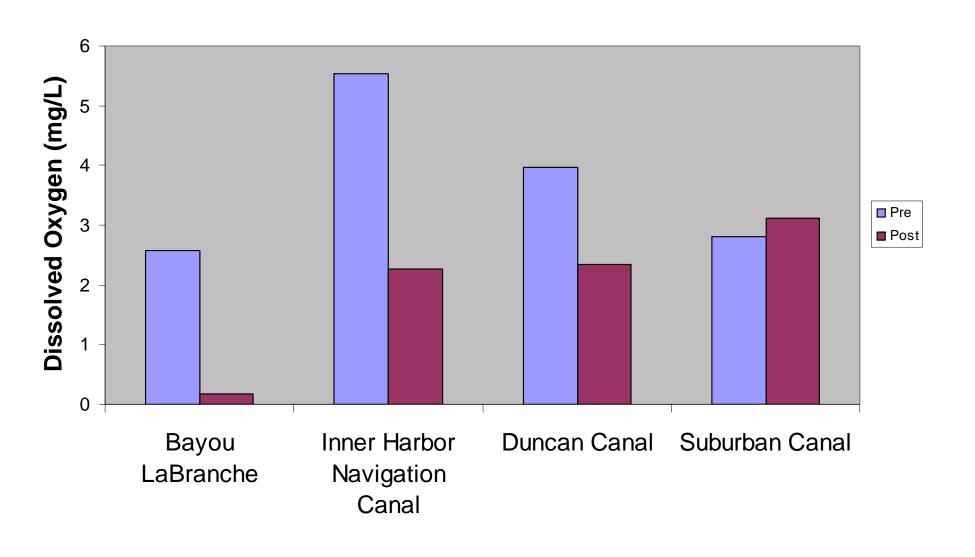
Lake Pontchartrain Water Impact Assessment



Fecal Coliform Density at Southshore Canal Sites



Average Dissolved Oxygen Concentrations at Southshore Canals





Landfill Site 😭 Expedia 90 Treasure St Abundance St. Industry St, Abundance St New Orleans, LA, 70126 Agriculture St Rorida Ave Industry St Florida Ave. Lausay py 237 taw St tow St 3021 N Dorgenois St N Dorgenous St N Roch A Faciliary Peace Ct N Rochebleve St N Torki St 3 411 N Galvez St N Miro St N Galvez 5t N Johnson St N Johnson St N Prieur St N Prieur 🗸 N- Prieur St N Roman St N Derbigny S N-Roman St N Derbigby St N Derbigny 5t N Claibothe Ave by N Derbigny or N Robertson St N Claiborne Ave 39 46 N Villere St ©2005 Microsoft Corp ©2004 NAVTEQ, and JorgDT, Inc

Ag. Street

Lead = 846 ug/L

Contaminant Sorption / Flocculation

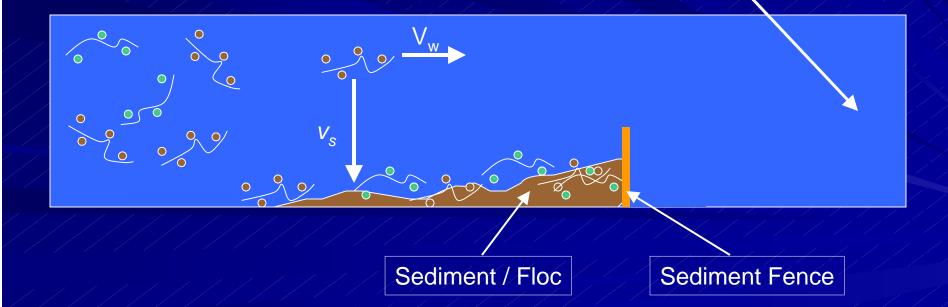
- Commonly used concept in Water Treatment
- Powdered Activated Carbon (PAC)
 - Sorbs contaminants (fuel...)
 - Reduces turbidity
- Polymer
 - Chain with positive and negative charges to bind to charged particles
 - Binds to colloidal particles creating a "floc"
 - Binds to PAC / contaminants into a "floc"
 - Increases particle size and "floc" settles out

Contaminant Sorption / Flocculation

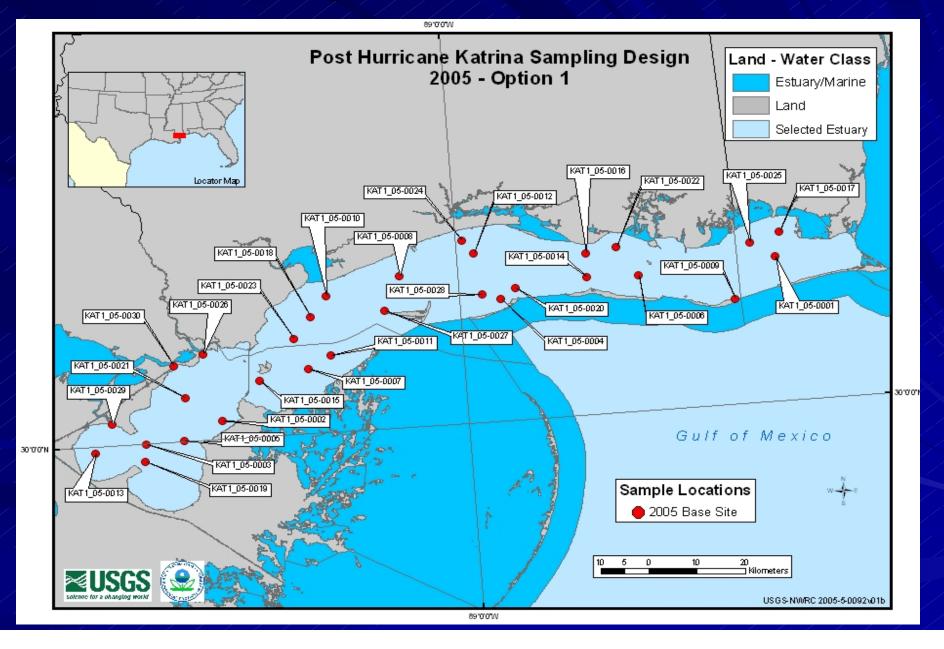
Use:

- In front of storm water drains
- Around suspect pools
- Sand Bags, sediment fences

Cleaner Water



Tissue Sampling Sites in the Gulf Coastal Area



Summary

- Fast Reaction Environment
- Many Agencies and Organization Involved
- Expedient water quality protection measures were integrated with dewatering
- GIS and remote sensing provided an important information management framework
- Initial water conditions were much better than expected largely due to enormous dilution
- Water quality continues to be monitored and longer term impacts will be evaluated



Managing Water Quality Issues During Hurricane Katrina Recovery Operations

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